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springs of the State, with over 150 analyses of waters. The waters are divided into muriatic, alkaline, sulphatic, chalybeate, and sulphur. The origin of each of these is briefly discussed. The methods of analyses, classification, and therapeutic uses are also considered. For those who are especially interested in analyses of water and for the citizens of Missouri and other States who desire a knowledge of the location and uses of the various springs the volume is invaluable. It is a volume to be consulted rather than one to be read.

JOSEPH F. JAMES.

Washington, May 13, 1893.

*A Handy Book for Brewers.* Being a Practical Guide to the Art of Brewing and Malting. By HERBERT EDWARDS WRIGHT, M.A. London, Crosby, Lockwood, & Son. 530 p. 8°

MR. WRIGHT has, in the present volume, expanded and enlarged an earlier work well known to the profession, entitled, "A Handbook for Young Brewers," giving the conclusions of modern research in so far as they bear upon the practice of brewing, as well as much practical detail, manipulative and structural. Few books of the size other than mere statistical records contain the amount of information herein included, and if the author has sacrificed style to space it can not be considered a fault in this instance. The book is not intended for general reading, but for the student of brewing, and is to supplement rather than to supplant practical teaching at the works. There is much, however, that is of value to others, both to chemist and to general scientist, as witness the excellent chapters on water, the laboratory, on ferments and fermentation, yeasts, etc. The latter subjects in particular are cleverly treated, and nowhere do we remember seeing the various theories and hypotheses massed together so conveniently for comparison and ready reference. Complete details of malting and brewing operations are carefully given, differing customs are placed in juxtaposition, and in all cases the scientific discussion of chemical and vital changes accompanies the description of the process. It is unfortunate that the glossary originally planned as an appendix to the text was finally omitted, as there are few industrial operations with more technical and "shop" expressions than brewing, and the free use of these in some of the chapters—the author resting, of course, upon his

intended glossary—would be rather confusing to the uninitiated. The subject is one of many ramifications, and as such could more easily be handled in three volumes than in one, but Mr. Wright has succeeded admirably with this difficult condensation, and has omitted nothing essential to a thorough knowledge of the subject.

C. P.

*An Outline of the Documentary History of the Zuñi Tribe.* By A. F. BANDELIER. *Somatological Observations on Indians of the Southwest.* By DR. HERMAN F.C. TEN KATE. In a *Journal of American Ethnology and Archaeology.* J. Walter Fewkes, editor. Vol. III. Boston and New York, Houghton, Mifflin, & Co. 1892.

THE scientific work accomplished by the Hemenway Expedition is gradually becoming known to the world through the medium of Dr. Fewkes's journal. The documentary history of the Zuñis during the 16th and 17th centuries, by Mr. Bandelier, is of absorbing interest and reflects the vast labor that had been expended in its compilation. In the identification of the Seven Cities of Cibola with the ancient Zuñi pueblos, the evidence formerly adduced is made so conclusive, by the introduction of new data, that it seems impossible for any one to fail to be convinced. The events which led to the Pueblo uprising against the Spaniards in 1680 are minutely recorded. Probably half the paper is devoted to copious notes and citations from original sources—principally manuscripts now in the hands of the Expedition. On page 114, the date of Fray Juan del Bal's arrival in New Mexico is given as 1771, instead of 1671, an obvious misprint, as the missionary was killed in the revolt above alluded to.

The second part of the volume is a summary report by Dr. ten Kate of his anthropologic observations of the Pima, Papago, Maricopa, Yuma and Zuñi Indians, as well as of the human remains found in the ruined pueblos of the Salado Valley, Arizona, and in one of the Cibolan cities. Although the investigations of Dr. ten Kate and Mr. Cushing were from totally different points of view they unite in the conclusion that "the pre-Columbian Arizonians were closely related to the Zuñis of to-day." In the opinion of Dr. ten Kate the types of North American Indians are not exclusively American, but present only the characteristics of the Mon-

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*Laboratory Calculation and Specific-Gravity Tables.* By JOHN S. ADRIANCE, A.M. Second edition. New York, John Wiley & Sons. Interleaved. 114 p.

IN some respects the author has in this second edition given us a new book, having enlarged the original tables and added others of importance. This increase of substance has, too, a value of its own in works such as these, being of far greater importance here than similar additions in general and descriptive works, for not only is the reputation of a book of tables based upon the accuracy of the figures, but also largely upon its completeness. We have all relied more or less upon like works for aid in laboratory calculations, and yet when certain data are found absent, how soon the book will fall into disuse entirely and make its way to the top shelves! Mr. Adriance, however, himself a consulting chemist and fully alive to the necessities of the case, has chosen not only such tables as are in constant use, but also those of frequent or less frequent need, covering extraordinarily well the field of ordinary chemical analysis. Such a work as this is of true assistance, and despite the claim urged by some chemists as to the possible introduction of error when using "ready-made results," we believe the chance of error to be greater when these same results have to be calculated under the strain of physical fatigue, following a long day or night of analytical or experimental work. Naturally all tables of factors, and all data of this kind, should be proven in moments of leisure, and in important cases, notably those involving legal testimony, they should be thrown aside altogether; but for daily use in the laboratory, they are invaluable in the saving of time and mental labor. Not only is the substance of the book "good," but in appearance it is neatness itself, each word and figure is clear-cut and distinct, an element highly important in tabular statements. The book is interleaved

and ample opportunity thus given the chemist for additions and remarks.

C. P.

*Chemical Theory for Beginners.* By LEONARD DOBBIN, Ph.D., and JAMES WALKER, Ph.D., D. SC., Assistants in the Chemistry Department, University of Edinburgh. London and New York, Macmillan and Co., 1892. 240 p.

Of the vast number of text-books bearing upon chemistry, we have but few treating of its foundation or theory. The smaller works merely touch upon theoretical discussion, while the larger treatises presuppose an extensive knowledge of the same. It is then a fact that only those students with the advantages of able instruction and scientific associations arrive at a really clear understanding of the ground-work of chemical notation, reaction and law. "Students enter the laboratory at once," is a familiar phrase in many college announcements, and there are excellent arguments for such a custom, provided a thorough study of theory accompanies the practical demonstration. More often, however, in general science courses the theory is disposed of in one or two brief lectures, all effort being concentrated upon a rapid advance into the field of "the elements, their compounds, their characteristics and reactions."

The above work is, we believe, rather unfortunately named, for while it will be easily understood by a beginner, and is a most excellent book for such a one, still it can and will be read advantageously by many advanced students and practical chemists. The wording is smooth and attractive, always interesting, never fatiguing; the student is carried forward, by an easy and natural progression, from the nature of things to a study of chemical action, of combustion, the laws of Boyle, Charles, and Avogadro, of density and of the atomic weights. Chemical notation is not reached until the 12th chapter, where, with the knowledge already gained, its discussion is of value and intelligible to the beginner. The later chapters contain an entirely non-mathematical exposition of the more important principles of general chemistry reviewed in the light of recent research, treating of the kinetic molecular theory, mass action, solution, electrolysis equivalence, the periodic law, etc.

C. P.

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For sale or exchange.—One latest complete edition of Watt's Dictionary of Chemistry, in fair condition; one thirty volume edition (9th) of Allen's Encyclopedia Britannica, almost new. Will sell cheap for cash or will exchange for physical or chemical apparatus. Address Prof. W. S. Leavenworth, Ripon College, Ripon, Wis.

Exchange.—One celestial, one terrestrial globe, one lunatellis and charts, celestial maps, diagrams and ephemeris from 1830 to 1893, astronomical works, all in good condition. Will sell cheap or exchange. Make offer. C. H. Van Dorn, 79 Nassau St., New York.

The Rev. A. C. Waghorne, New Harbor, Newfoundland, wishes to sell collections of Newfoundland and Labrador plants, all named by competent botanists. He is going on a missionary journey along the Labrador coast, from the middle of July till October, and in return for much needed aid towards (Episcopal) Church purposes in that region, will be glad to be of service to any botanists who may write to him. Letters posted in the U. S. up to July 1 will reach him at the above address, and if posted later will be forwarded.

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